

beveled cam surface of the bottom tip 92 engages the latch plate 101 to cause the latch plate 101 to deflect downwardly against the biasing force exerted by the springs 105 until the screw jack 90 reaches the upright position at which point the bottom tip 92 falls within the concave cutout 104 allowing the latch plate 101 to snap back into engaging position by the biasing force exerted by the springs 105, trapping the screw jack 90 between the latch plate 101 and the stops 54.

It will be understood that changes in the details, materials, steps and arrangements of parts which have been described and illustrated to explain the nature of the invention will occur to and may be made by those skilled in the art upon a reading of this disclosure within the principles and scope of the invention. The foregoing description illustrates the preferred embodiments of the invention; however, concepts, as based upon the description, may be employed in other embodiments without departing from the scope of the invention.

In the way of example, one skilled in the art will recognize that the principles of the invention described above can be utilized on substantially any vehicle or apparatus having a load bed or other member that is pivoted relative to a frame. More specifically, these principles can be used to provide a dump bed on a pick-up or dump truck (not shown). The actuator 40 or 90 would be trapped between the bed of the pickup truck and the cab with the yoke 50 pivotally connected to the bed. Furthermore, by inserting an articulating tilt frame between the bed and the chassis of the truck, both tilt and dump functions could be selectively provided for the truck.

Also, the actuator could be in the form of a bottle jack 40, which has its own internal reservoir of hydraulic fluid, a mechanically operated screw jack 90, or other actuators such as a conventional hydraulic cylinder with an external port adapted for connection to a remote source of hydraulic power. Furthermore, the hydraulic cylinder could be mounted upside down, as compared to the depiction of the actuators 40 and 75 in the drawings, with the rod extending downwardly. In such a configuration, the hydraulic cylinder could have the hydraulic fluid supplied through a hydraulic connector associated with a hollow rod so that the port and associated hoses do not have to move vertically with the barrel of the hydraulic cylinder.

Still further, the yoke does not have to mount to the top of the actuator rod, but can be connected to the bottom of the hydraulic component moving vertically, particularly where the hydraulic cylinder is mounted upside down as described above. A similar configuration is shown and described above with respect to the screw jack 90. A low profile configuration with the yoke mounted to the bottom of the vertically movable barrel would be particularly desirable with respect to the adaptation of the principles of the invention disclosed above in conjunction with a pick-up or dump truck.

Having thus described the invention, what is claimed is:

1. A trailer comprising:

an articulated frame having at least a pair of transversely opposed wheels rotatable about an axis of rotation, said articulated frame including a tilt frame pivotable about a tilt pivot axis and a draft tongue pivotally connected to said tilt frame for pivotal movement about an articulation axis located forwardly of said tilt pivot axis, said draft tongue being adapted for connection to a prime mover; and

a bed frame supported on said articulated frame for selective pivotal movement relative to said articulated frame about a dump pivot axis oriented rearwardly of

said tilt pivot axis, said bed frame being selectively movable with said tilt frame about said tilt pivot axis.

2. The trailer of claim 1 wherein said bed frame is also connected to said articulated frame by a connection apparatus positioned forwardly of said tilt pivot axis to restrict pivotal movement of said bed frame relative to said tilt frame, said articulated frame including a locking device selectively coupling said tilt frame to said draft tongue to restrict pivotal movement of said tongue relative to said tilt frame about said articulation axis.

3. The trailer of claim 2 wherein said bed frame moves vertically relative to said draft tongue when pivoting about said tilt axis and when pivoting about said dump axis, said tilt frame moving vertically relative to said draft tongue only when said bed frame pivots about said tilt axis.

4. The trailer of claim 3 further comprising:

an actuator mechanism supported on said tongue and coupled to said bed frame to power the pivotal movement of said bed frame about at least one of said dump pivot axis and said tilt pivot axis.

5. The trailer of claim 4 wherein said actuator mechanism comprises:

a mounting bracket affixed to said tongue;

a linear actuator supported on said mounting bracket; and

a yoke connected to said actuator for vertical movement thereof in response to a corresponding linear movement of said actuator, said yoke being pivotally connected to said bed frame to cause vertical movement thereof in response to said linear movement of said actuator.

6. The trailer of claim 5 wherein said actuator is pivotally connected to said mounting bracket for pivot movement about a generally horizontal actuator pivot axis positioned in general transverse alignment with a yoke pivot axis defined by the pivotal connection of said yoke with said bed frame, such that said actuator is pivotally movable between an upright operative position and a lowered inoperative position oriented generally parallel to said draft tongue.

7. The trailer of claim 6 wherein said actuator is pivotally connected to said mounting bracket by a pivot pin located at a position vertically spaced from said actuator pivot axis.

8. The trailer of claim 6 wherein said actuator is pivotally connected to said mounting bracket by a pivot pin, said pivot pin defining said actuator pivot axis.

9. The trailer of claim 6 wherein said bed frame is positioned above said tilt frame, said dump pivot axis being defined by a pivot mechanism connecting said bed frame to said tilt frame, said pivot mechanism including a pair of laterally opposing support members pivotally supported in a rear frame member of said tilt frame.

10. The trailer of claim 9 wherein said actuator is operatively associated with a latch mechanism for controlling the pivotal movement thereof between said upright operative position and said lowered inoperative position.

11. The trailer of claim 10 wherein said actuator is oriented below a top surface of a load bed supported on said bed frame when placed into said lowered inoperative position.

12. The trailer of claim 10 wherein said actuator has an internal reservoir for hydraulic fluid, said actuator being provided with a manually operable hand pump to effect extension of said hydraulic actuator.

13. The trailer of claim 12 wherein said actuator includes a connection device for connection to a remote supply of hydraulic power.

14. An actuating mechanism for use with a frame and a load bed pivotally movable about a pivot axis relative to said frame, comprising:

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a mounting bracket affixed to said frame;
 a linear actuator pivotally supported on said mounting bracket for pivot movement about a generally horizontal actuator pivot axis; and
 a yoke connected to said actuator and pivotally connected to said load bed by a pivot mechanism defining a yoke pivot axis to effect vertical movement of said load bed in response to a corresponding linear movement of said actuator.

15 15. The actuating mechanism of claim 14 wherein said actuator pivot axis is positioned in general transverse alignment with said yoke pivot axis so that said actuator is pivotally movable between an upright operative position and a lowered inoperative position.

16. The actuating mechanism of claim 15 wherein said actuator is pivotally connected to said mounting bracket by a pivot pin located at a position vertically spaced from said actuator pivot axis.

17. The actuating mechanism of claim 15 wherein said actuator is pivotally connected to said mounting bracket by a pivot pin, said pivot pin defining said actuator pivot axis.

18. The actuating mechanism of claim 17 wherein said actuator is a screw jack being extensible through manual manipulation of a crank handle.

19. The actuating mechanism of claim 18 wherein said actuator further comprises:

an outer casing;
 a telescopic section extensible from said outer casing upon appropriate manipulation of said crank handle; and
 a bottom tip member slidably extensible from said telescopic section, said bottom tip being detachably connected to said telescopic section by a locking device such that a release of said locking device permits said telescopic section to freely slide on said bottom tip member to enable said load bed to move vertically through the application of forces other than through said actuator.

20. The actuating mechanism of claim 15 wherein said frame corresponds to a trailer having a draft tongue pivotally connected to said frame for movement about an articulation axis, said load bed being pivotally connected to said frame at a dump pivot axis located rearwardly of said articulation axis, said actuator causing an articulation between said draft tongue and said frame thereby effecting a pivotal movement of said load bed about a tilt pivot axis located between said articulation axis and said dump pivot axis.

21. The actuating mechanism of claim 20 wherein said actuator is operatively associated with a latch mechanism for controlling the pivotal movement thereof between said upright operative position and said lowered inoperative position, said lowered inoperative position being positioned below a top surface of said load bed.

22. The actuating mechanism of claim 21 wherein said actuator has an internal reservoir for hydraulic fluid, said actuator being provided with a manually operable hand pump to effect extension of said hydraulic actuator.

23. The actuating mechanism of claim 22 wherein said actuator includes a connection device for connection to a remote supply of hydraulic power.

24. The actuating mechanism of claim 14 wherein said actuator mechanism includes a hydraulic cylinder.

25. An apparatus comprising:

a frame supported above the ground by a pair of wheels rotatable about an axis of rotation;
 a load bed pivotally connected to said frame for vertical movement relative thereto; and

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an actuator mechanism positioned forwardly of said load bed and being pivotally supported on said frame at an actuator pivot axis, said actuator mechanism including a yoke pivotally connected to said load bed for movement relative thereto about a yoke pivot axis oriented in substantial alignment with said actuator pivot axis.

26. The apparatus of claim 25 wherein said load bed includes a first stop apparatus positioned to restrict rearward pivotal movement of said actuator and a frame supported second stop apparatus positioned to restrict forward pivot movement of said actuator.

27. The apparatus of claim 26 wherein said second stop apparatus is a latch mechanism that can be selectively operated to allow said actuator mechanism to pivotally move forwardly from an upright operative position to a lowered inoperative position.

28. The apparatus of claim 27 wherein said actuator mechanism includes a screw jack being extensible through manual manipulation of a crank handle.

29. The apparatus of claim 28 wherein said screw jack comprises:

an outer casing;
 a telescopic section extensible from said outer casing upon appropriate manipulation of said crank handle; and
 a bottom tip member slidably extensible from said telescopic section, said bottom tip being detachably connected to said telescopic section by a locking device such that a release of said locking device permits said telescopic section to freely slide on said bottom tip member to enable said load bed to move vertically through the application of forces other than through said crank handle.

30. The apparatus of claim 27 wherein said actuator mechanism includes a hydraulic actuator having an internal reservoir for hydraulic fluid, said hydraulic actuator being provided with a manually operable hand pump to effect extension of said hydraulic actuator.

31. The apparatus of claim 30 wherein said hydraulic actuator includes a connection device for connection to a remote supply of hydraulic power.

32. The apparatus of claim 26 wherein said actuator mechanism includes a hydraulic cylinder.

33. The apparatus of claim 32 wherein said hydraulic cylinder includes a connection device for connection to a remote supply of hydraulic power.

34. The apparatus of claim 27 further comprising:

a draft tongue adapted to be connected to a prime mover, said tongue being pivotally connected to said frame for articulation about an articulation axis positioned forwardly of said axis of rotation;

said load bed being pivotally mounted on said frame for generally vertical movement relative thereto about a dump pivot axis located rearwardly of said axis of rotation, said frame being pivotable about a tilt pivot axis located between said articulation axis and said dump pivot axis;

a first connection device interconnecting said load bed and said frame to control the pivotal movement of said load bed relative to said frame, a disengagement of said first connection device permitting said load bed to pivot about said dump pivot axis; and

a second connection device interconnecting said frame and said tongue to control the articulation of said frame relative to said tongue, a disengagement of said second connection device with the engagement of said first

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connection device permitting said load bed to pivot with said frame about said tilt pivot axis while said tongue articulates relative to said frame about said articulation axis.

35. The trailer of claim 34 wherein said tilt pivot axis coincides with said axis of rotation, said actuator mechanism being supported on said tongue and coupled to said load bed to power the pivotal movement of said load bed about at least one of said dump pivot axis and said axis of rotation.

36. The trailer of claim 35 wherein said actuator mechanism comprises:

- a mounting bracket affixed to said tongue;
- a linear actuator supported on said mounting bracket; and
- a yoke connected to said linear actuator to effect vertical movement thereof in response to a corresponding movement of said linear actuator, said yoke being pivotally connected to said load bed to cause vertical movement thereof.

37. An actuating mechanism for use between a frame and a movable member pivotally connected to said frame to effect pivotal movement of said movable member relative to said frame, comprising:

- a linear actuator supported on said frame and including a housing defining a first end of said linear actuator and an extensible member defining a second end of said linear actuator, said extensible member being linearly movable from an operative portion of said housing spaced from said first end; and
- a yoke connected to said linear actuator at a connection point and having arms pivotally connected to said movable member along a yoke pivot axis to effect vertical movement of said movable member relative to

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said frame in response to a corresponding linear movement of said extensible member, said yoke pivot axis being located such that said operative portion is located between said connection point and said yoke pivot axis when said linear actuator is fully retracted with said first and second ends spaced at a minimum distance.

38. The actuating mechanism of claim 37 wherein one of said first and second ends is pivotally connected to said frame to define an actuator pivot, said yoke pivot axis being aligned with actuator pivot when said linear actuator is in a completely collapsed condition with said first end at a minimum distance from said second end to permit said linear actuator and said yoke to be pivotable about said actuator pivot and said yoke pivot axis to move between an upright operative position to a lowered inoperative position.

39. The actuating mechanism of claim 38 further comprising a latch mechanism for controlling the pivotal movement of said linear actuator and said yoke between said upright operative position and said lowered inoperative position.

40. The actuating mechanism of claim 39 wherein said movable member corresponds to a load bed of a trailer and said frame corresponds to a draft tongue of said trailer, said linear actuator and said yoke being positionable below said load bed when placed into said lowered inoperative position.

41. The actuating mechanism of claim 40 wherein said yoke is affixed to said housing, said arms extending past said operative portion to align with a remote end of said extensible member.

42. The actuating mechanism of claim 40 wherein said yoke is affixed to said extensible member.

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